

Claims

[c1]

A transportable storage system comprising:

a flexible, collapsible bladder having at least one interior layer and one exterior layer;
a flexible diaphragm extending continuously from a portion of the interior layer of said bladder, said diaphragm defining first and second ends of the bladder;
said bladder further having an orifice at each of the first and second ends of the bladder;
means to inject and release compressed air, gas or fluid to and from said first end of the bladder through the orifice of the first end of the bladder;
and
means to inject and expel liquids or semi-liquids to and from said second end of the bladder through the orifice of the second end of the bladder.

[c2]

The transportable storage system of claim 1, wherein said bladder is cylindrical in shape.

[c3]

The transportable storage system of claim 1, where the diaphragm is substantially the same shape and size as the second end of the bladder.

[c4]

The transportable storage system of claim 1, wherein the interior layer of said bladder comprises

a first interior layer from which the diaphragm extends, which first interior layer constitutes the interior of the first end of the bladder, and
a second interior layer partially affixed to said first interior layer where the unaffixed portion of said second interior layer constitutes the interior of the second end of the bladder.

[c5]

The transportable storage system of claim 4, where the diaphragm extends from the first interior layer of the bladder along the longitudinal circumference of the bladder at or around the latitudinal center of the bladder.

[c6]

The transportable storage system of claim 1, where
said exterior layer of the bladder is manufactured substantially from

neoprene, and

said interior layer of the bladder is manufactured substantially from nitrile rubber.

- [c7] The transportable storage system of claim 1, where the bladder further comprises a layer of bonding material between the interior and exterior layers of the bladder to facilitate the bonding of said layers.
- [c8] The transportable storage system of claim 7, where the bonding material substantially constitutes tygum.
- [c9] The transportable storage system of claims 1 or 7, where the exterior of the interior layer of the bladder is wound with one or more layers of fiber in a cross-hatch pattern, at a first angle to the longitudinal axis of the bladder, and at a second angle to the latitudinal axis of the bladder.
- [c10] The transportable storage system of claim 1, wherein the means to inject and release compressed air, gas or fluid to and from the first end of the bladder further comprises:
- a plurality of rigid plates, each having an orifice, said plates being affixed to the interior and exterior of the first end of the bladder, and positioned on the bladder such that the orifices of said plates are aligned with the orifice of the first end of the bladder; and
 - an intake nozzle engaged with at least one of the rigid plates and aligned with said orifices.
- [c11] *Sub 11* The transportable storage system of ~~claim 10~~, wherein ~~the means to inject and release compressed air, gas or fluid~~ further comprises a portable air compressor or tank, or pressurized gas or liquid injector engaged with the intake nozzle.
- [c12] The transportable storage system of claim 1, wherein the means to inject and expel liquids or semi-liquids to and from said second end of the bladder further comprises:
- a plurality of rigid plates, each having an orifice, said plates being affixed to the interior and exterior of the second end of the bladder and positioned on the bladder such that the orifices of said plates are aligned

with the orifice of the second end of the bladder,
a nipple engaged with at least one of the rigid plates and aligned with
said orifices; and
a male quick disconnect engaged with said nipple.

[c13] The transportable storage system of claim 12, wherein the means to inject and
expel liquids to and from said second end of the bladder further comprises
discharge means engaged with said the nipple and male quick disconnect.

[c14] *Sub 61* The transportable storage system of claim 13, wherein said discharge means
further comprises a female quick disconnect, a close nipple engaged with said
female disconnect, a reducing bushing engaged with said close nipple, a
camlock engaged with said reducing bushing; and a fuel hose engaged with said
camlock.

[c15] The transportable storage system of claim 12, wherein the means to inject and
expel liquids or semi-liquids to and from said second end of the bladder further
comprises injection means engaged with said nipple and said male quick
disconnect.

[c16] *Sub 61* A method of manufacture of a transportable storage system having a bladder
with at least two interior layers, a diaphragm extending from the interior most
layer of said bladder and defining the first and second ends of the bladder, and
at least one exterior layer, the system further having means to create pressure
in the first end of the bladder and means to inject liquids into and expel liquids
from the second end of the bladder, comprising the following steps:
laying the first layer of the interior of the bladder and corresponding diaphragm
on a mandrel shaped to the intended ultimate size of the bladder;
laying the second layer of the interior of the bladder on top of said first layer
and diaphragm, with a removable material placed between the diaphragm and
the corresponding second end of the interior of the bladder
laying the exterior layer of the bladder on top of the interior layers of the
bladder;
bonding the layers of the bladder by means of pressure and heat;
removing the bladder from the mandrel; and

removing the material between the diaphragm and the second layer of the interior of the bladder;
affixing the pressure means to said bladder; and
affixing the liquid injection and expulsion means to said bladder.

[c17] The method of manufacture of a transportable storage system of claim 16, further comprising the step of laying a layer of bonding material on top of the second layer of the interior of the bladder, before laying the exterior layer of the bladder.

[c18] *Sub* The method of manufacture of a transportable storage-system of claim 16, further comprising the step of winding the second layer of the interior of the bladder with one or more layers of fiber.

[c19] A liquid storage process using a bladder having a flexible diaphragm encapsulated therein comprising:
filling the bladder with liquid or semi-liquid;
applying pressure to the interior of the bladder causing the diaphragm to expand within the bladder; and
discharging the liquid or semi-liquid stored in the bladder.

Add a1

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